

AMENDMENTS TO THE SPECIFICATION

Please amend the following paragraphs.

[0063] A catalyst layer of a positive electrode was produced as follows. First, 7 parts by weight of platinum-supporting carbon with an average particle diameter of 5 μm , in which 50 parts by weight of platinum fine particles with an average particle diameter of 3 nm were supported on 50 parts by weight of “Ketchen Black EC” (Trade Name) produced by Lion Akzo Co., Ltd., 86 parts by weight of a proton conductive material “Nafion” (Trade Name, the concentration of a solid content is 5% by weight) produced by ElectroChem Inc., and 7 parts by weight of water were prepared respectively. They were mixed and dispersed uniformly with an ultrasonic disperser, and the obtained slurry was dried under reduced pressure to remove a solvent. Complex particles coagulated by drying were crushed with a planetary ball mill at a rotation number of 200 rpm for one hour. Consequently, complex particles with an average particle diameter of 10 μm were obtained.

[0065] A catalyst layer of a negative electrode was produced as follows. First, 7 parts by weight of platinum-supporting carbon with an average particle diameter of 3 μm , in which 50 parts by weight of platinum-ruthenium alloy (alloy weight ratio 1:1) fine particles with an average particle diameter of 3 nm were supported on 50 parts by weight of the above-mentioned “Ketchen Black EC”, 86 parts by weight of the above-mentioned “Nafion”, and 7 parts by weight of water were prepared respectively. They were mixed and dispersed uniformly with an ultrasonic disperser, and the obtained slurry was dried under reduced pressure to remove a solvent. Complex particles coagulated by drying were crushed with a planetary ball mill at a

rotation number of 200 rpm for one hour. Consequently, complex particles with an average particle diameter of 9 μm were obtained. Next, a catalyst layer of a negative electrode was formed in the same way as in the positive electrode, except that the complex particles were applied to one surface of the solid electrolyte opposite to the surface where the catalyst layer of the positive electrode has been formed so that the amount of platinum-ruthenium became 3.0 mg/cm^2 .

[0069] (Example 2) A catalyst layer of a positive electrode was produced as follows. First, 7 parts by weight of platinum-supporting carbon with an average particle diameter of 5 μm , in which 50 parts by weight of platinum fine particles with an average particle diameter of 3 nm were supported on 50 parts by weight of "Ketchen Black EC" (Trade Name) produced by Lion Akzo Co., Ltd., 86 parts by weight of a proton conductive material "Nafion" (Trade Name, the concentration of a solid content is 5% by weight) produced by ElectroChem Inc., and 7 parts by weight of water were prepared respectively. They were mixed and dispersed uniformly with an ultrasonic disperser, and the obtained slurry was dried under reduced pressure to remove a solvent. Complex particles coagulated by drying were crushed with a planetary ball mill at a rotation number of 50 rpm for 10 minutes. Consequently, complex particles with an average particle diameter of 120 μm were obtained. The obtained complex particles were weighed and placed so that the amount of platinum became 3.0 mg/cm^2 , and subjected to pressure forming at a pressure of 16 MPa to form a catalyst layer of a positive electrode.

[0070] A catalyst layer of a negative electrode was produced as follows. First, 7 parts by weight of platinum-supporting carbon with an average particle diameter of 3 μm , in which 50 parts by weight of platinum-ruthenium alloy (alloy weight ratio 1:1) fine particles with an average particle diameter of 3 nm were supported on 50 parts by weight of "Ketchen Black EC", 86 parts by weight of the above-mentioned "Nafion", and 7 parts by weight of water were prepared respectively. They were mixed and dispersed uniformly with an ultrasonic disperser, and the obtained slurry was dried under reduced pressure to remove a solvent. Complex particles coagulated by drying were crushed with a planetary ball mill at a rotation number of 50 rpm for 10 minutes. Consequently, complex particles with an average particle diameter of 110 μm were obtained. The obtained complex particles were weighed and placed so that the amount of platinum-ruthenium became 3.0 mg/cm², and subjected to pressure forming at a pressure of 16 MPa to form a catalyst layer of a negative electrode. The electrode area was set to be 10 cm² in both the positive and negative electrodes.

[0074] (Example 3) A catalyst layer of a positive electrode was produced as follows. First, 7 parts by weight of platinum-supporting carbon with an average particle diameter of 5 μm , in which 50 parts by weight of platinum fine particles with an average particle diameter of 3 nm were supported on 50 parts by weight of "Ketchen Black EC" (Trade Name) produced by Lion Akzo Co., Ltd., 86 parts by weight of a proton conductive material "Nafion" (Trade Name, the concentration of a solid content is 5% by weight) produced by ElectroChem Inc., and 7 parts by weight of water were prepared respectively. They were mixed and dispersed uniformly with an ultrasonic disperser, and the obtained slurry was granulated by a spray dry method. Consequently, complex particles with an average particle diameter of 30 μm were obtained.

[0076] A catalyst layer of a negative electrode was produced as follows. First, 7 parts by weight of platinum-supporting carbon with an average particle diameter of 3 μm , in which 50 parts by weight of platinum-ruthenium alloy (alloy weight ratio 1:1) fine particles with an average particle diameter of 3 nm were supported on 50 parts by weight of the above-mentioned “Ketchen Black EC”, 86 parts by weight of the above-mentioned “Nafion”, and 7 parts by weight of water were prepared respectively. They were mixed and dispersed uniformly with an ultrasonic disperser, and the obtained slurry was granulated by a spray dry method. Consequently, complex particles with an average particle diameter of 28 μm were obtained. Next, a catalyst layer of a negative electrode was obtained in the same way as in the positive electrode, except that the complex particles were applied to one surface of the solid electrolyte opposite to the surface where the catalyst layer of the positive electrode has been formed so that the amount of platinum-ruthenium became 3.0 mg/cm^2 .

[0081] Furthermore, a catalyst layer of a positive electrode was produced as follows. First, 7 parts by weight of platinum-supporting carbon with an average particle diameter of 5 μm , in which 50 parts by weight of platinum fine particles with an average particle diameter of 3 nm were supported on 50 parts by weight of “Ketchen Black EC” (Trade Name) produced by Lion Akzo Co., Ltd., 86 parts by weight of a proton conductive material “Nafion” (Trade Name, the concentration of a solid content is 5% by weight) produced by ElectroChem Inc., and 7 parts by weight of water were prepared respectively. They were mixed and dispersed uniformly with an

ultrasonic disperser, and the obtained slurry was granulated by a spray dry method. Consequently, complex particles with an average particle diameter of 30 μm were obtained.

[0083] A catalyst layer of a negative electrode was produced as follows. First, 7 parts by weight of platinum-supporting carbon with an average particle diameter of 3 μm , in which 50 parts by weight of platinum-ruthenium alloy (alloy weight ratio 1:1) fine particles with an average particle diameter of 3 nm were supported on 50 parts by weight of the above-mentioned “Ketchen Black EC”, 86 parts by weight of the above-mentioned “Nafion”, and 7 parts by weight of water were prepared respectively. They were mixed and dispersed uniformly with an ultrasonic disperser, and the obtained slurry was granulated by a spray dry method. Consequently, complex particles with an average particle diameter of 28 μm were obtained. Next, a catalyst layer of a negative electrode was formed in the same way as in the positive electrode, except that the complex particles were applied to one surface of the solid electrolyte opposite to the surface where the catalyst layer of the positive electrode has been formed so that the amount of platinum-ruthenium became 3.0 mg/cm^2 .

[0087] (Comparative Example 1) A catalyst layer of a positive electrode was produced as follows. First, 7 parts by weight of platinum-supporting carbon with an average particle diameter of 5 μm , in which 50 parts by weight of platinum fine particles with an average particle diameter of 3 nm were supported on 50 parts by weight of “Ketchen Black EC” (Trade Name) produced by Lion Akzo Co., Ltd., 86 parts by weight of a proton conductive material “Nafion” (Trade Name, the concentration of a solid content is 5% by weight) produced by ElectroChem

Inc., and 7 parts by weight of water were prepared respectively. They were mixed and dispersed uniformly with an ultrasonic disperser, and the obtained slurry was applied to one surface of a solid electrolyte "Nafion 117" (Trade Name, thickness: 180 μm) produced by Dupont so that the amount of platinum became 3.0 mg/cm^2 , followed by drying, whereby a catalyst layer of a positive electrode was formed on one surface of the solid electrolyte.

[0088] A catalyst layer of a negative electrode was produced as follows. First, 7 parts by weight of platinum-supporting carbon with an average particle diameter of 3 μm , in which 50 parts by weight of platinum-ruthenium alloy (alloy weight ratio 1:1) fine particles with an average particle diameter of 3 nm were supported on 50 parts by weight of the above-mentioned "Ketchen Black EC", 86 parts by weight of the above-mentioned "Nafion", and 7 parts by weight of water were prepared respectively. They were mixed and dispersed uniformly with an ultrasonic disperser, and the obtained slurry was applied to one surface of the solid electrolyte opposite to the surface where the catalyst layer of the positive electrode has been formed so that the amount of platinum-ruthenium became 3.0 mg/cm^2 , followed by drying, whereby a catalyst layer of a negative electrode was formed on one surface of the solid electrolyte.

[0092] (Comparative Example 2) A catalyst layer of a positive electrode was produced as follows. First, 7 parts by weight of platinum-supporting carbon with an average particle diameter of 5 μm , in which 50 parts by weight of platinum fine particles with an average particle diameter of 3 nm were supported on 50 parts by weight of "Ketchen Black EC" (Trade Name) produced by Lion Akzo Co., Ltd., 86 parts by weight of a proton conductive material "Nafion"

(Trade Name, the concentration of a solid content is 5% by weight) produced by ElectroChem Inc., and 7 parts by weight of water were prepared respectively. They were mixed and dispersed uniformly with an ultrasonic disperser, and the obtained slurry was dried under reduced pressure to remove a solvent. Complex particles coagulated by drying were crushed with a planetary ball mill at a rotation number of 300 rpm for 6 hours. Consequently, complex particles with an average particle diameter of 2.5 μm were obtained.

[0094] A catalyst layer of a negative electrode was produced as follows. First, 7 parts by weight of platinum-supporting carbon with an average particle diameter of 3 μm , in which 50 parts by weight of platinum-ruthenium alloy (alloy weight ratio 1:1) fine particles with an average particle diameter of 3 nm were supported on 50 parts by weight of the above-mentioned “Ketchen Black EC”, 86 parts by weight of the above-mentioned “Nafion”, and 7 parts by weight of water were prepared respectively. They were mixed and dispersed uniformly with an ultrasonic disperser, and the obtained slurry was dried under reduced pressure to remove a solvent. Complex particles coagulated by drying were crushed with a planetary ball mill at a rotation number of 300 rpm for 6 hours. Consequently, complex particles with an average particle diameter of 2.5 μm were obtained. Next, a catalyst layer of a negative electrode was formed in the same way as in the positive electrode, except that the complex particles were applied to one surface of the solid electrolyte opposite to the surface where the catalyst layer of the positive electrode has been formed so that the amount of platinum-ruthenium became 3.0 mg/cm^2 .